2. LABOUR BASED SURFACE DRESSING

In remote locations, for limited areas (such as shoulders) or when the specialist equipment is too expensive or is not available, surface dressing may be carried out by labour based methods. The quality of work will be just as good as by mechanised methods if the works are properly managed.

Labour based surface dressing may be carried out using bitumen emulsion or cut back bitumen. Materials specifications are the same as for mechanised surface dressing.

The activities that need particular attention are:

- heating and temperature control of the bitumen when cut back bitumen is used.
- applying the bitumen at the correct rate of spread.
- complete coverage of the binder by the chippings before the binder cools/breaks.

Up to 800 m² per day of labour based surface dressing can be achieved by one crew.
2.1 RESOURCES REQUIRED

**Personnel**

1 foreman,
1 bitumen heater operator,
1 - 2 bitumen layers/spray lance operators,
squeegee operators,
drivers,
2 traffic controllers,
4-6 workmen.

**Plant and Tools**

1 bitumen heater and towing/carrying vehicle,
1 spray lance if available,
1 truck for transporting aggregates,
1 light vehicle for supervision and general duties,
1 bitumen thermometer.
PART C - RESEALING OPTIONS

Small Items of Equipment

2 wheel barrows,  
shovels,  
pickaxes,  
2 rakes,  
brooms,  
watering cans or other bitumen dispensers,  
squeegees.

Tools and Supplies

1 drum of diesel oil for use in cleaning  
the tools and equipment,  
rags,  
number of paint brushes,  
2 metal buckets,  
chalk, or paint for marking,  
stringlines.
PART C - RESEALING OPTIONS

2.2 HEATING THE BINDER
(for cut back bitumen)

The binder will normally be delivered to site in drums. It should be decanted into a suitable bitumen heater which may be:

- towed,
- static, or
- vehicle mounted.

The heating may be carried out by:

- diesel burners,
- wood,
- coal or other fuel.

If necessary the specified amount of diesel should be added to achieve the required viscosity of cutback.

Care must be taken to ensure that the materials:

- are well mixed,
- are not overheated.

It is IMPORTANT to use a bitumen thermometer.

Bitumen application temperature ranges are shown on Page III - 143.
2.3 USING BITUMEN EMULSION

If bitumen emulsion is used as the binder it will not normally require heating*. Emulsions consist of bitumen droplets mixed with water in such a way that, when applied, the water evaporates leaving the bitumen to “break” and to perform as a normal penetration grade. The choice of emulsions should be made with regard to the type of stone being used and reference to the suppliers.

It should be noted that bitumen emulsions have a limited storage life. They should normally be used within 6 months of purchase. Drums should be rolled to mix the contents thoroughly before use.

*Cationic emulsion will need to be heated
Volume: $V$ litres
Width of area: $w$ metres
Rate of spread: $r$ l/m²

Then,

$L = \text{Length of Area (m)} = \frac{V}{w \times r}$
2.4 SETTING OUT THE WORK

Robust containers, such as watering cans, must be used for carrying and applying the hot cut back or emulsion to the road surface. Each container must have a fixed volume mark of known quantity.

The area of road to be covered by one container can be calculated using the specified rate of spread of binder.

To achieve the length of road to be covered by one container divide the volume by the width of road to be sealed and the rate of spread.

Using stringlines, mark the cleaned area of the road surface with chalk for each container of binder.
2.5 APPLYING THE BINDER

When the binder has reached the required temperature it is poured into the containers and carefully carried to the placement site*.

Emulsions will normally be used directly from the drums after thorough mixing.

The binder is poured over the marked area as evenly as possible. The squeegees are used immediately to ensure even distribution.

The personnel handling hot bitumen must be supplied with protective clothing and footwear.

If a hand lance is available this may be used to apply the binder. However practice and skill are required to evenly apply the correct amount of binder.

*Beware of the build up of cold bitumen on the inside of the containers.
2.6 APPLYING THE CHIPPINGS

The chippings should be applied as soon as possible after the binder is distributed.

This may be done by:

- spreading the chippings by hand from stockpiles previously placed on the road shoulder,
- casting the chippings by hand from the rear of a truck reversing slowly over the previously laid stone.

Care must be taken to ensure as complete a coverage as possible without over applying chippings.

Workmen can follow up with a wheel barrow to top up areas where the chippings are spread too thinly.

The finished work is carefully rolled with the empty chipping truck as soon as the chippings are spread.